

6.3

Introduction to Linear Inequalities

Lesson 10

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Connect

We use **inequality** to model a situation that can be described by a range of numbers instead of a single number.

Inequality Symbols:

\leq	Less than or equal to
\geq	Greater than or equal to
$<$	Less than
$>$	Greater than

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A **linear equation** is true for only one value of the variable. $x = 2$

A **linear equality** is true for only many values of the variable. $x < 2$ $\{1, 0, -1, -2, \dots\}$

The solution of an **linear equality** is any value of the variable that makes the inequality true.

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Connect

EXAMPLE 1:

Define a variable and write an inequality for the situation given by the diagram.

let x represent the speed to travel.

$$x \leq 55$$

SPEED
LIMIT
55

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Connect

EXAMPLE 2:

Define a variable and write an inequality for the situation given by the diagram.

Let x represent the appropriate age.



$$x \leq 14$$

$$x \geq 14$$

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Practice

YOU TRY!

Define a variable and write an inequality for the situation given by the diagram.

Let x represent the appropriate temperatures.



$$x \leq 4$$

$$x < 4$$

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Practice

YOU TRY!

Define a variable and write an inequality for the situation given by the diagram.

You must have 10 items or less to use the express line at a grocery store.

Let x represent the number of items in a cart.

$$x \leq 10$$

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EXAMPLE 3:

We can illustrate the solutions of an inequality by graphing them on a number line.

Graph $a > 2$.



Since 2 is not part of the solution, we draw an open circle at 2 to indicate this.

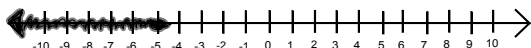
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Connect

EXAMPLE 4:

We can illustrate the solutions of an inequality by graphing them on a number line.

Graph $a \leq -5$.



Since -5 is part of the solution, we draw a shaded circle at -5 to indicate this.

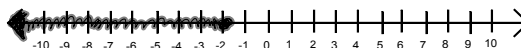
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Practice

YOU TRY!

We can illustrate the solutions of an inequality by graphing them on a number line.

Graph $-2 \geq x$.



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Discuss
the ideas

1. How is the solution of an inequality different from the solution of an equation? $x = 2$ $x < 2$ $\{1, 0, -1, -2 \dots\}$

2. How do you know whether to use an open circle or a shaded circle in the graph of an inequality?

$$\begin{array}{cc} x < 2 & x \leq 2 \\ \circ & \bullet \end{array}$$

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Practice

CLASSWORK!

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